

SEDIMENT TRANSPORT BY MASS - MOVEMENT PROCESSES  
AT THE EASTERN KORINTHIAKOS GULF

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Korinthiakos gulf is a narrow graben separating Sterea Hellas (Central Greece) and Peloponnesus, and is characterized by great depth (over 800m) and steep slopes. The eastern part of Korinthiakos gulf in particular, was surveyed during 1981 by the Marine Geology Department of IGME by using a 3,5KHz ORE profiler, a 3000m fathometer and a 3m. gravity corer.

In the area, the shelf is well developed only at the bays of Korinthos, Psara and Porto Germenio, where the shelf break is in most cases well distinguished from 70 to 100m. In the other nearshore areas the slope of the sea bottom is very steep and it is in fact an escarpment with little or no recent sedimentary cover. The deep areas of the gulf are dominated by the Alkyonides and the Korinthiakos basins. The first is of rectangular shape and its depth ranges from 250 to 360m., while the second is elongate with a NW-SE direction and it is outlined by the 800m. contour. The basins are separated by the Alkyonides Heights, and show a slight bottom gradient to the south.

The study of the 3,5KHz subbottom profiles showed that the sediment transport in the gulf is effected mainly by mass-movement processes, such as creep, slumping and mass flows, which transfer terrigenous sediments from the shallow to the deep areas. At the bays the sediments due to the gradual slope gradient increase are moving mainly by creep. In this process the sedimentary layering is distorted and the beds are folded and faulted by normal, usually antithetic, faulting. The folds have are up to 60m. wide, while the faults show displacements up to 15m. and are specially active around and after the shelf break. This gradual creeping results in slumping at the deeper parts of the bays, producing chaotic structures.

In the deep areas of the gulf (over 200m.) the sediments are transported toward the Alkyonides and Korinthiakos basins mainly by mass flow, slumping and turbiditic processes. At least, two large scarp areas were recognized one in each basin. In the Alkyonides basin the scarp area lies to the northeast of it and occurs at a depth of about 200 to 250m. It has an areal extend of about  $2 \text{ km}^2$  and the scarp faces are about 10 to 15m. high. The produced mass flow moved toward the SW, is about 10 km. long, has a width of 1,5 to 1,8 km, and was triggered by the earthquake activity of Febr. 24 to March 4, 1981<sup>1</sup>. Sea level indicators did not show any significant sea level change during the activity suggesting that the emplacement of the mass flow did not produce tsunami. The other scarp area lies west of the Alkyonides highs at a sea depth of 350 to 400m. and its areal extend is also about  $2 \text{ km}^2$ . The scarp faces are about 30m. high and the sediments have moved toward the Korinthiakos Basin in southwestern direction.

It seems that because of the lower bottom gradient in the escarpments north of the two basins, the sediments can accumulate there and then transported by mass flows, triggered by various mechanism one of which is the earthquake activity. On the contrary at the escarpment south of the two basins, the high bottom slope does not permit accumulation of sediments, and the latter are transported by slumping and or turbidites.

<sup>1</sup>Perissoratis, G., Mitropoulos, D., and Angelopoulos, I. 1981: An earthquake triggered submarine slump in the Alkyonides gulf (Eastern Korinthiakos gulf): HEAT Symposium, Proceedings V. II. 1981/1982 Athens, p. 126-135.